DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/03/2010 has been entered.

Response to Amendment

2. Amendment to the claims dated 2/03/2010 has been entered. Claims 1-51 have been amended. Claims 52-99 have been added.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claim 76 is objected to because of the following informalities:

Claim 76 recites “a temperature of approximately 284°C”. This appears to be a typo and should read " a temperature of approximately 284°F” as the specification discloses “140°C” which converts to 284°F.

Claim 98 and claim 99 are require the same claim limitations and the same claim dependency and are therefore duplicates of each other. One claim should be amended or cancelled.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 71 and 75 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 71 requires "the toothed belt is configured to replace a chain in a timing control system without any dimensional variations being made to the timing control system" it is unclear what structural limitations this recitation requires and therefore unclear as to the scope of the claim.

Claim 75 recites "the oil transport system" is is unclear as to what is required by this claim as no oil transport system is disclosed in the claim or in the parent claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claim 1-2, 4, 8-10, 25-26, 28, 32-34, 46, 51-52, 54, 71-77, 79 and 83-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1).

As per claims 1 and 8, Cicognani et al. discloses a toothed belt (Fig) for use with oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61), the belt comprising:

a body (1),

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material (Claim 1) the first and second materials chosen from the group consisting of glass, aramid, polyester , PBO and carbon fibers.

Danhauer et al. discloses a belt (10) having a body (12, 14, 16) and a plurality of resistant inserts (22), wherein the resistant inserts are produced from at least a first and a second material ([0019]), wherein the materials are made from glass fiber, carbon fiber, steel, polyester, rayon, polyaramide, or a blend of any of those above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the resistant inserts comprise fibers produced from at least a first and second material, wherein the first and second materials are chosen from glass and carbon fibers, as taught by Danhauer et al., for the purpose of producing a desired balance of strength and flexibility in the resistant inserts.

As per claim 25 and 32, Cicognani et al. discloses a timing control system for a motor vehicle (Col. 1, Ln. 4-5, Ln. 29-40) comprising at least one driving pulley, one driven pulley and a toothed belt (Col. 2, Ln. 54-58) adapted for use in substantially continuous contact with oil or partially immersed in oil, and materials for maintaining said tootehd belt in an oil wet condition (Col. 2, Ln. 55-61, Col. 3, Ln. 12-20);

said belt comprising a body (1), and

one or more teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material (Claim 1) the first and second materials chosen from the group consisting of glass, aramid, polyester , PBO and carbon fibers.

Danhauer et al. discloses a belt (10) having a body (12, 14, 16) and a plurality of resistant inserts (22), wherein the resistant inserts are produced from at least a first and

a second material ([0019]), wherein the materials are made from glass fiber, carbon fiber, steel, polyester, rayon, polyaramide, or a blend of any of those above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the resistant inserts comprise fibers produced from at least a first and second material, wherein the first and second materials are chosen from glass and carbon fibers, as taught by Danhauer et al., for the purpose of producing a desired balance of strength and flexibility in the resistant inserts.

As per claim 51, Cicognani et al. discloses a toothed belt (Fig) adapted for use in substantially continuous contact with oil or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61), the belt comprising:

a body (1),

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material (Claim 1) the first and second materials chosen from the group consisting of glass, aramid, polyester , PBO and carbon fibers.

Danhauer et al. discloses a belt (10) having a body (12, 14, 16) and a plurality of resistant inserts (22), wherein the resistant inserts are produced from at least a first and a second material ([0019]), wherein the materials are made from glass fiber, carbon fiber, steel, polyester, rayon, polyaramide, or a blend of any of those above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the resistant inserts comprise fibers produced from at least a first and second material, wherein the first and second materials are chosen from glass and carbon fibers respectively, as taught by Danhauer et al., for the purpose of producing a desired balance of strength and flexibility in the resistant inserts.

As per claims 72 and 83, Cicognani et al. discloses a method for providing a belt for use with oil comprising :

providing an oil-wet environment (Col. 2, Ln. 59-61),

providing a toothed belt to operate in said oil-wet enviornment (Col. 2, Ln. 55-61), said belt comprising:

a body (1),

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material (Claim 1) the first and second materials chosen from the group consisting of glass, aramid, polyester , PBO and carbon fibers.

Danhauer et al. discloses a belt (10) having a body (12, 14, 16) and a plurality of resistant inserts (22), wherein the resistant inserts are produced from at least a first and a second material ([0019]), wherein the materials are made from glass fiber, carbon fiber, steel, polyester, rayon, polyaramide, or a blend of any of those above.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the resistant inserts comprise fibers produced from at least a first and second material, wherein the first and second materials are chosen from glass and carbon fibers, as taught by Danhauer et al., for the purpose of producing a desired balance of strength and flexibility in the resistant inserts.

As per claims 2, 26, 52 and 77, Danhauer et al. further discloses the first material covers the second material at least partly ([0019], the two materials are helically wound together, thus the first material will at least partly cover the second material).

As per claim 4, 9-10, 28, 33-34, 54, 79, and 84-85 Danhauer et al. discloses the first material is glass fiber and the second material is carbon fiber ([0019]) such that the first material has a lower modulus with respect to the second material.

As per claim 46, Danhauer et al. further discloses the use of discrete fibers in the elastomeric material ([0026]).

As per claim 71, Cicognani et al. discloses the toothed belt is configured to replace a chain in a timing control system without any dimensional variations being made to the timing control system (Col. 1, Ln. 34-40).

As per claims 73 and 75, Cicognani et al. discloses the belt coming in contact with the belt, and a pump for use in circulating the oil, however fails to explicitly disclose the use of an oil spray or the application of such being at a rate of approximately 5.8 gallons/hr. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Cicognani et al. to include an oil spray and to apply said oil spray at a rate of approximately 5.8, as the use of such is a design choice of which one of ordinary skill in the art at the time of the invention would be capable of based on the system requirements.

As per claim 74, Cicognani et al. further discloses the oil-wet environment comprises an oil bath (Col. 2, Ln. 59-61).

As per claim 76, Cicognani et al. further discloses the oil being at 140°C which converts to 284° F (Col. 3, Ln. 1-5).

9. Claims 3, 27, 53, and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and further in view of Welk et al. (US 2004/0033857 A1).

Modified Cicognani et al. fails to explicitly disclose the first material entirely surrounds the second material.

Welk et al. discloses a belt (10) having an elastomeric body (11) and a plurality of tensile resistant members (13) wherein the resistant members comprise a strand core

(100) comprising a plurality of strands (101) and a sheath (200) comprising a plurality of strands (201) wherein the sheath is made of a first material ([0026]) and the core is made of a second material ([0025]) and wherein the first material completely surrounds the second material (Fig. 2-Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the first material entirely surrounds the second material, as taught by Welk et al. for the purpose of providing a balance between tensile strength and flexibility.

10. Claim 5-7, 29-31, 55-57 and 80-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and further in view of Mashimo et al. (US 4,498,891).

Modified Cicognani et al. fails to explicitly disclose the second material occupies a surface between 15 and 75% (claims 5, 29 and 55) or preferably between 35 and 45 % (claims 6, 30 and 56) of the total surface of the body, and the resistant inserts have two twists in the same direction (claims 7, 31 and 57).

Mashimo et al. discloses a belt (Fig. 1, Fig. 2) having resistant inserts (16) being woven in the type of Lang's twist (Col. 2, Ln. 60-64) and occupying a surface between 35 and 45% of the total (Table 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani al. to include the second material occupies a surface of between 15 and 75% and between 35 and 45 % of the total

surface of the body, and the resistant inserts have two twists in the same direction, as taught by Mashimo et al., for the purpose of providing stiffness to the belt.

11. Claims 11-12, 35-36, 58-59, and 86-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and further in view of Knutson (US 6,945,891).

Modified Cicognani et al. discloses all elements of the claimed invention as disclosed in claim 1 above, but fails to explicitly disclose the resistant inserts have been treated with an RFL comprising a latex (claim 11 and 35) which comprises an elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups (claim 12 and 36).

Knutson discloses a power transmission belt (10) in which tensile fibers (18) of carbon are coated with an RFL composition (Col. 6, Ln. 8-23) wherein the RFL composition comprises a latex which comprises the copolymer HNBR (Col. 6, Ln. 45-60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the resistant inserts have been treated with an RFL comprising a latex which comprises an elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups, as taught by Knutson, for the purpose of ensuring adhesion of the resistant inserts to the belt.

12. Claims 13-14, 37-38, 60-61 and 88-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US

2002/0098935 A1) and Knutson (US 6,945,891), as applied to claim 12 above, and further in view of Acten (US 7,396,884 B2).

Modified Cicognani et al. fails to explicitly disclose the nitrile groups are in a percentage between 33 and 49 weight % of the final copolymer (claim 13, 37 and 60) or preferably 39 weight % (claims 14, 38 and 61).

Acten discloses an adhesive base for reinforcing materials (Col. 1, Ln. 16-20) containing HNBR wherein the nitrile group content is in the range of 10 to 50 wt. % or preferably 15 to 39 wt. %.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the nitrile groups are in a percentage between 33 and 49 weight % of the final copolymer, or preferably 39 weight %, as taught by Acten, for the purpose of ensuring adhesion of the resistant inserts to the belt.

13. Claims 15-18, 39-42, 50, 62-65, and 90-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and further in view of Osaka et al. (US 7,056,249 B1).

As per claims 15, 17-18, 39, 41-42, 50, 62, 64-65, 90, and 92-93 Cicognani et al. further discloses the fabric is externally coated by a resistant layer wherein the resistant layer comprises an oil resistant elastomer (Col. 2, Ln. 6-10). Modified Cicognani et al. fails to explicitly disclose the resistant layer comprises a florinated plastomer, specifically polytetrafluoroethylene (claims 18, 42 and 65) in an amount between 101

and 150 parts per weight with the elastomeric material (claims 17, 41, 50 and 64), and a vulcanizing agent.

Osaka et al. discloses a belt (10) having a fabric layer (24, 56) coated by a resistance layer (40) of polytetrafluoroethylene (Col. 6, Ln. 26-32) in an amount of 30 to 200 parts per weight of a first elastomeric material (36, Col. 6, Ln. 7-12, Ln. 43-46).

Osaka et al. fails to explicitly disclose the use of a vulcanizing agent, however Osaka et al. discloses the step of vulcanizing after the treatment of the fabric (Col. 8, Ln. 44-50), however it would have been known by one in the art that a vulcanizing agent could be used to speed up vulcanization.

It would have been obvious to one of ordinary skill in the art at the time of the time of the invention to modify the belt of Modified Cicognani et al. to include a resistant layer of polytetrafluoroethylene in an amount between 101 and 150 parts per weight of a first elastomeric material and a vulcanizing agent for the purpose of reducing friction.

As per claims 16, 40, 63, and 91 Cicognani et al. discloses the belt body being made of an oil resistant elastomeric composition but fails to explicitly disclose the body comprises a mixture based on a second elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups.

Danhauer et al. further discloses the body (12) comprises a mixture based on a second elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups ([0018], NBR- nitrile butadiene rubber).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to futher include the body

comprises a mixture based on a second elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups, as taught by Danhauer et al., for the purpose of selecting an appropriate material and properties for a chosen application of the belt.

14. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and further in view of Mashimo et al. (US 4,498,891).

As per claims 43, Modified Cicognani et al. fails to explicitly disclose the use of a second fabric on the back of the belt body.

Mashimo et al. discloses a belt (Fig. 1, Fig. 2) having resistant inserts (16) being and the use of a fabric (14) located on the back of the surface of the belt body (11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include a second fabric on the backing of the belt, as taught by Mashimo et al., for the purpose of protecting the belt body.

15. Claims 19-22, 44-45, 66-69 and 94-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and Osaka et al. (US 7,056,249 B1) and further in view of Mashimo et al. (US 4,498,891).

As per claims 19, 66 and 94, Modified Cicognani et al. fails to explicitly disclose the use of a second fabric on the back of the belt body.

Mashimo et al. discloses a belt (Fig. 1, Fig. 2) having resistant inserts (16) being and the use of a fabric (14) located on the back of the surface of the belt body (11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include a second fabric on the backing of the belt, as taught by Mashimo et al., for the purpose of protecting the belt body.

As per claims 20-21, 44-45, 67-68, and 95-96 Osaka et al. discloses a belt (10) having a fabric layer (24, 56) coated by a resistance layer (40) of polytetrafluoroethylene (Col. 6, Ln. 26-32) to reduce friction.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the fabric on the back surface of the belt body to also be coated by a resistance layer of polytetrafluoroethylene, as taught by Osaka et al., for the purpose of reducing friction.

As per claims 22, 69 and 97, Danhauer et al. further discloses the use of discrete fibers in the elastomeric material ([0026])

16. Claims 23 and 98-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and Osaka et al. (US 7,056,249 B1) and Mashimo et al. (US 4,498,891) and further in view of Knutson (US 6,945,891).

Modified Cicognani et al. fails to explicitly disclose the fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material.

Knutson et al. discloses a power transmission belt (10) having of discrete fibers in the elastomeric material (Col. 4, Ln. 7-25) in the range of about 0.5 to 20 phr with respect to the elastomeric material (Col. 4, Ln. 7-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material, as taught by Knutson et al., for the purpose of increasing strength of the belt.

17. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and further in view of Knutson (US 6,945,891).

Modified Cicognani et al. fails to explicitly disclose the fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material.

Knutson et al. discloses a power transmission belt (10) having of discrete fibers in the elastomeric material (Col. 4, Ln. 7-25) in the range of about 0.5 to 20 phr with respect to the elastomeric material (Col. 4, Ln. 7-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material, as taught by Knutson et al., for the purpose of increasing strength of the belt.

18. Claims 24, 48, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and further in view of Nakajima et al. (US 5,306,213).

Modified Cicognani et al. fails to explicitly disclose the belt being treated with a polymer resistant to swelling between the toothing and the back side.

Nakajima et al. discloses a toothed belt (30) in which a rubber layer (14) being made of an oil–resistant rubber composition different from that of the belt body (12) in order to prevent swelling of the belt.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the belt treated with a polymer resistant to swelling, as taught by Nakajima et al., fur the purpose of increasing the life of the belt.

19. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Danhauer et al. (US 2002/0098935 A1) and Nakajima et al. (US 5,306,213), and further in view of Hashimoto et al. (US 2004/0127316 A1).

Modified Welk et al. discloses all elements of the claimed invention as applied to claim 25 above, but fail to explicitly disclose a pad tensioner or a pad.

Hashimoto et al. discloses a pad tensioner (100, TL) and a pad (TG) for use in imparting tension on a timing belt of a power transmission system in a vehicle ([0001], [0008]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt power transmission system of Modified Welk et al. to include a pad or pad tensioner, as taught by Hashimoto et al., for the purpose of maintaining tension in the belt.

20. Claims 1-3, 25-27, and 72-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1).

As per claim 1, Cicognani et al. discloses a toothed belt (Fig) for use with oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61), the belt comprising:

a body (1),

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material.

Welk et al. discloses a belt (10) comprising a body (11) and a plurality of resistant inserts (13) wherein the resistant inserts are produced from at least a first (100, 101, [0025]) and a second material (200, 201, [0026]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the resistant inserts comprise fibers produced from at least a first and second material, as taught by Wlk et al., for the purpose of producing a desired balance of strength and flexibility in the resistant inserts.

As per claim 25, Cicognani et al. discloses a timing control system for a motor vehicle (Col. 1, Ln. 4-5, Ln. 29-40) comprising at least one driving pulley, one driven pulley and a toothed belt (Col. 2, Ln. 54-58) adapted for use in substantially continuous contact with oil or partially immersed in oil, and materials for maintaining said tootehd belt in an oil wet condition (Col. 2, Ln. 55-61, Col. 3, Ln. 12-20);

said belt comprising a body (1), and

one or more teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material.

Welk et al. discloses a belt (10) comprising a body (11) and a plurality of resistant inserts (13) wherein the resistant inserts are produced from at least a first (100, 101, [0025]) and a second material (200, 201, [0026]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the resistant inserts comprise fibers produced from at least a first and second material, as taught by Wlk et al., for the purpose of producing a desired balance of strength and flexibility in the resistant inserts.

As per claims 72, Cicognani et al. discloses a method for providing a belt for use with oil comprising :

providing an oil-wet environment (Col. 2, Ln. 59-61),

providing a toothed belt to operate in said oil-wet enviornment (Col. 2, Ln. 55-61), said belt comprising:

a body (1),

a plurality of teeth (3, Col. 2, Ln. 3-5) extending from a first surface of said body (Fig.), said teeth being coated by a first fabric (6), and

a plurality of resistant inserts (2) made from flexible and inextensible materials such as fiberglass, steel and the like (Col. 2, Ln. 1-2);

wherein said toothed belt is adapted to operate in substantially continuous contact with or partially immersed in oil (Col. 1, Ln. 29-40, Col. 2, Ln. 55-61).

Cicognani et al. fails to explicitly disclose the resistant inserts comprise fibers produced from at least a first and second material.

Welk et al. discloses a belt (10) comprising a body (11) and a plurality of resistant inserts (13) wherein the resistant inserts are produced from at least a first (100, 101, [0025]) and a second material (200, 201, [0026]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Cicognani et al. to include the resistant inserts comprise fibers produced from at least a first and second material, as taught by Wlk et al., for the purpose of producing a desired balance of strength and flexibility in the resistant inserts.

As per claims 2-3, 26-27 and 77-78, Welk et al. further discloses first material entirely surrounds said second material (Fig. 2-4).

As per claims 73 and 75, Cicognani et al. discloses the belt coming in contact with the belt, and a pump for use in circulating the oil, however fails to explicitly disclose

the use of an oil spray or the application of such being at a rate of approximately 5.8 gallons/hr. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Cicognani et al. to include an oil spray and to apply said oil spray at a rate of approximately 5.8, as the use of such is a design choice of which one of ordinary skill in the art at the time of the invention would be capable of based on the system requirements.

As per claim 74, Cicognani et al. further discloses the oil-wet environment comprises an oil bath (Col. 2, Ln. 59-61).

As per claim 76, Cicognani et al. further discloses the oil being at 140°C which converts to 284° F (Col. 3, Ln. 1-5).

21. Claims 11-12, 35-36 and 86-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1), and further in view of Knutson (US 6,945,891).

Modified Cicognani et al. fails to explicitly disclose the resistant inserts have been treated with an RFL comprising a latex (claims 11 and 35) which comprises an elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups (claims 12 and 36).

Knutson discloses a power transmission belt (10) in which tensile fibers (18) of carbon are coated with an RFL composition (Col. 6, Ln. 8-23) wherein the RFL composition comprises a latex which comprises the copolymer HNBR (Col. 6, Ln. 45-60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the resistant inserts have been treated with an RFL comprising a latex which comprises an elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups, as taught by Knutson, for the purpose of ensuring adhesion of the resistant inserts to the belt.

22. Claims 13-14, 37-38, and 88-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1) and Knutson (US 6,945,891), and further in view of Acten (US 7,396,884 B2).

Modified Cicognani et al. fails to explicitly disclose the nitrile groups are in a percentage between 33 and 49 weight % of the final copolymer (claims 13 and 37) or preferably 39 weight % (claims 14 and 38).

Acten discloses an adhesive base for reinforcing materials (Col. 1, Ln. 16-20) containing HNBR wherein the nitrile group content is in the range of 10 to 50 wt. % or preferably 15 to 39 wt. %.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the nitrile groups are in a percentage between 33 and 49 weight % of the final copolymer, or preferably 39 weight %, as taught by Acten, for the purpose of ensuring adhesion of the resistant inserts to the belt.

23. Claims 15-18, 39-42, 50 and 90-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1) and further in view of Osaka et al. (US 7,056,249 B1).

As per claims 15, 17-18, 39, 41-42, 50, 90 and 92-93 Cicognani et al. further discloses the fabric is externally coated by a resistant layer wherein the resistant layer comprises an oil resistant elastomer (Col. 2, Ln. 6-10). Modified Cicognani et al. fails to explicitly disclose the resistant layer comprises a florinated plastomer, specifically polytetrafluoroethylene (claims 18 and 42) in an amount between 101 and 150 parts per weight with the elastomeric material (claims 17,41 and 50), and a vulcanizing agent.

Osaka et al. discloses a belt (10) having a fabric layer (24, 56) coated by a resistance layer (40) of polytetrafluoroethylene (Col. 6, Ln. 26-32) in an amount of 30 to 200 parts per weight of a first elastomeric material (36, Col. 6, Ln. 7-12, Ln. 43-46).

Osaka et al. fails to explicitly disclose the use of a vulcanizing agent, however Osaka et al. discloses the step of vulcanizing after the treatment of the fabric (Col. 8, Ln. 44-50) however it would have been known by one in the art that a vulcanizing agent could be used to speed up vulcanization.

It would have been obvious to one of ordinary skill in the art at the time of the time of the invention to modify the belt of Modified Cicognani et al. to include a resistant layer of polytetrafluoroethylene in an amount between 101 and 150 parts per weight of a first elastomeric material and a vulcanizing agent, for the purpose of reducing friction.

As per claims 16, 40 and 91, Welk et al. further discloses the belt body (11) comprising a mixture based on a second elastomeric material formed from a copolymer obtained from a diene monomer and a monomer containing nitrile groups ([0028]).

24. Claims 19-21, 43-45 and 94-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1) and Osaka et al. (US 7,056,249 B1) and further in view of Mashimo et al. (US 4,498,891).

As per claims 19, 43, and 94 Modified Cicognani et al. fails to explicitly disclose the use of a second fabric on the back of the belt body.

Mashimo et al. discloses a belt (Fig. 1, Fig. 2) having resistant inserts (16) being and the use of a fabric (14) located on the back of the surface of the belt body (11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include a second fabric on the backing of the belt, as taught by Mashimo et al., for the purpose of protecting the belt body.

As per claims 20-21, 44-45 and 95-96, Osaka et al. discloses a belt (10) having a fabric layer (24, 56) coated by a resistance layer (40) of polytetrafluoroethylene (Col. 6, Ln. 26-32) to reduce friction.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the fabric on the back surface of the belt body to also be coated by a resistance layer of

25. Claims 22-23 and 97-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1) and Osaka et al. (US 7,056,249 B1), and further in view of Knutson (US 6,945,891).

Modified Cicognani et al. fails to explicitly disclose fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material.

Knutson et al. a power transmission belt (10) having of discrete fibers in the elastomeric material (Col. 4, Ln. 7-25) in the range of about 0.5 to 20 phr with respect to the elastomeric material (Col. 4, Ln. 7-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include fibers in an amount in weight between 0.5 and 15% with respect to said elastomeric material, as taught by Knutson et al., for the purpose of increasing strength of the belt.

26. Claims 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1), and further in view of Knutson (US 6,945,891).

Modified Cicognani et al. fails to explicitly disclose fibers are present in an amount in weight between 0.5 and 15% with respect to said elastomeric material.

Knutson et al. a power transmission belt (10) having of discrete fibers in the elastomeric material (Col. 4, Ln. 7-25) in the range of about 0.5 to 20 phr with respect to the elastomeric material (Col. 4, Ln. 7-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include fibers in an amount in weight between 0.5 and 15% with respect to said elastomeric material, as taught by Knutson et al., for the purpose of increasing strength of the belt.

27. Claims 24 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1) and further in view of Nakajima et al. (US 5,306,213).

Modified Cicognani et al. discloses all elements of the claimed invention as described in claim 1 above, but fails to explicitly disclose the belt being treated with a polymer resistant to swelling between the toothing and the back side.

Nakajima et al. discloses a toothed belt (30) in which a rubber layer (14) being made of an oil–resistant rubber composition different from that of the belt body (12) in order to prevent swelling of the belt.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Cicognani et al. to include the belt treated with a polymer resistant to swelling, as taught by Nakajima et al., fur the purpose of increasing the life of the belt.

28. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cicognani et al. (US 4,099,422) in view of Welk et al. (US 2004/0033857 A1) and Nakajima et al. (US 5,306,213), and further in view of Hashimoto et al. (US 2004/0127316 A1).

Modified Welk et al. discloses all elements of the claimed invention as applied to claim 25 above, but fail to explicitly disclose a pad tensioner or a pad.

Hashimoto et al. discloses a pad tensioner (100, TL) and a pad (TG) for use in imparting tension on a timing belt of a power transmission system in a vehicle ([0001], [0008]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt power transmission system of Modified Welk et al. to include a pad or pad tensioner, as taught by Hashimoto et al., for the purpose of maintaining tension in the belt.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA MOMPER whose telephone number is (571)270-5788. The examiner can normally be reached on M-F 6:00-3:30 (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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